

2009 NSF Large Facilities Workshop
April 17, 2009

Maintenance Issues & Planning

UCAR Physical Plant Services

Introduction

John Pereira

- ▶ Who we are
- ▶ What we do

Our Presentation

- Mesa Lab – History of Renovations
- Process – Organize Projects & Request Funds
- Research Aviation Facility project
- New Factor – Sustainability
 - Employee Health
- Discussion

Maintenance Issues

- Scheduled Maintenance
- On-Demand Maintenance
- Deferred Maintenance

Planning

- Operating budgets
- The obstacles
 - Impact on operations
 - Impact on deferred maintenance
- Options
 - Long Range Planning
 - Debt Financing

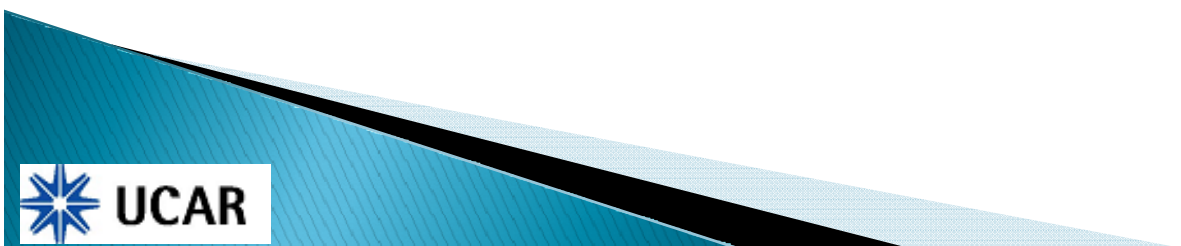
Long Range Planning

- ▶ A New Approach
 - Inflation
 - Priorities
- ▶ Outstanding Deferred Maintenance
 - A new plan

New Factor – Sustainability

- ▶ A Benefit of Delayed Projects
 - Changing Technologies
 - Energy Savings
 - Compliance
 - Sustainability
 - Green Opportunities

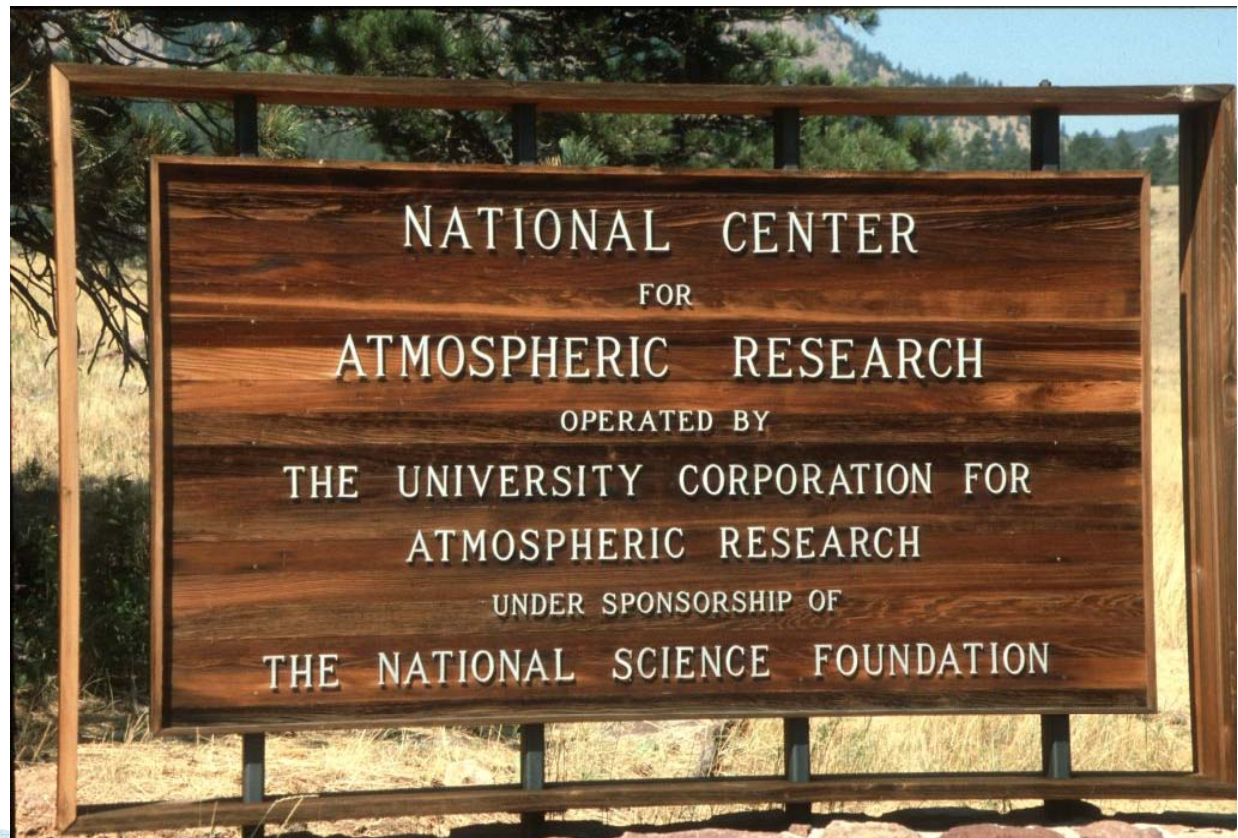
Discussion



Deferred Maintenance Projects

Steven Haynes

- ▶ Mesa Lab Facility
 - ML Facility Introduction
 - Original DM project scope – MLUR
 - Results so far



Mesa Lab

Coming Out
of the Ground

1964



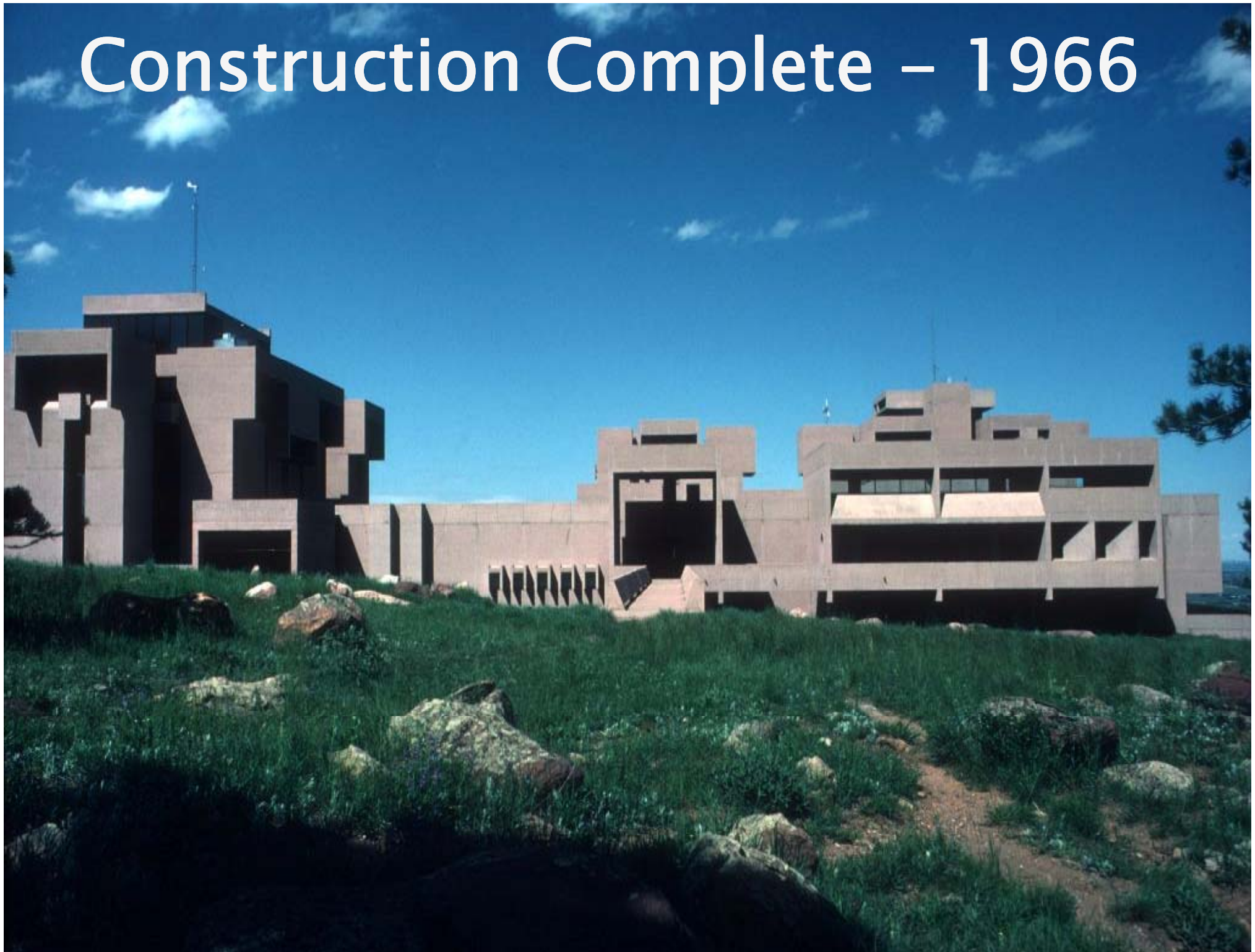
Mesa Lab

Construction

1964 – 1966



Construction Complete – 1966



Construction Complete – 1966





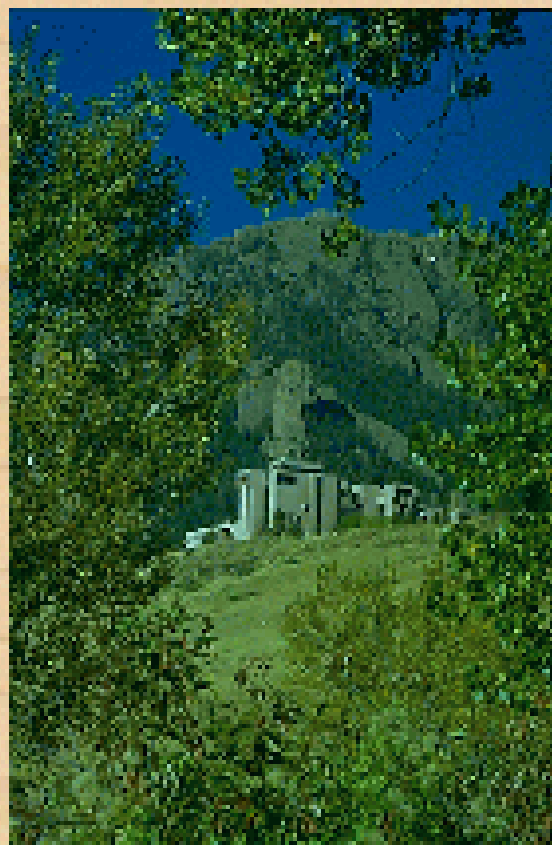


Space Type Summary

<u>Space Type</u>	<u>Number of Spaces</u>	<u>Total Sq. Feet</u>
General Offices	380	32,395
Laboratories	62	25,169
Library	1	5,522
Computer Center	1	8,379
Public Spaces	29	20,703
Building Services	290	75,168
Facilities Support Spaces	72	25,747
Storage/Misc.	22	12,918

January 25, 1999

MLUR – 1999 Scope Criteria



What needs to be done?

Life safety items need to be installed to protect the occupants of the building.

Accessibility needs to be improved to allow access to all individuals

Structural repairs need to be made before the deterioration becomes irreparable.

Building infrastructure systems - heating, air conditioning, lighting, electrical distribution, etc. - which are beyond their useful lives need to be refurbished in a planned manner, minimizing outages.

The background of the slide is a photograph of a modern, multi-story building with a flat roof and large windows. The building is situated on a green lawn. In the background, there are dark, rocky mountains under a blue sky with some clouds. The text is overlaid on this image.

Mesa Lab Refurbishment

Categories and Overall Costs

Health and Safety Projects	\$ 2,860,000
Protection of the Structure	\$ 1,700,000
Infrastructure Refurbishments	\$ 6,840,000
<u>Move and Lease Costs</u>	<u>\$ 600,000</u>
TOTAL	\$12,000,000

January 25, 1999

Tree Plaza Refurbishment

18



Tree Plaza – Before



Tree Plaza – Before



Tree Plaza – Construction



Tree Plaza – Construction



Tree Plaza – Completed Summer 2001



Front Drive Refurbishment



Front Drive – Before



Front Drive – Construction



Front Drive – Construction



Front Drive – Completed Spring Of 2002

28



HVAC, Elect., Lighting Retrofit

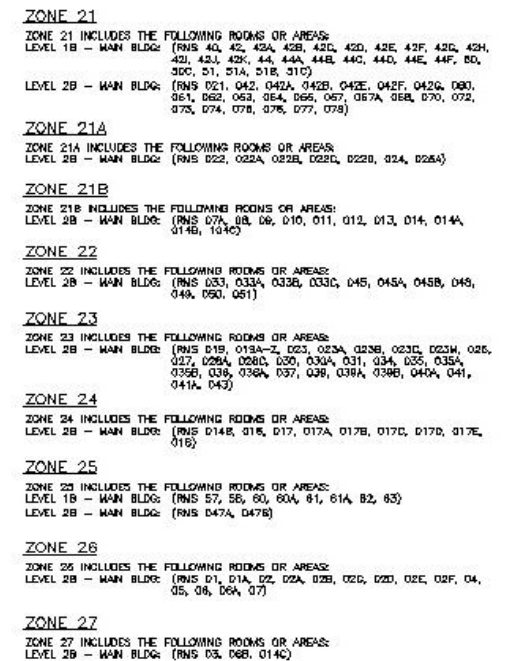


HVAC, Elect., Lighting Retrofit



HVAC Retrofit





MLUR – HVAC, Elect, Lighting

- ▶ Construction Stopped and Contract Closed
8/2003

New Lab (FL0), Occupied 10/2005

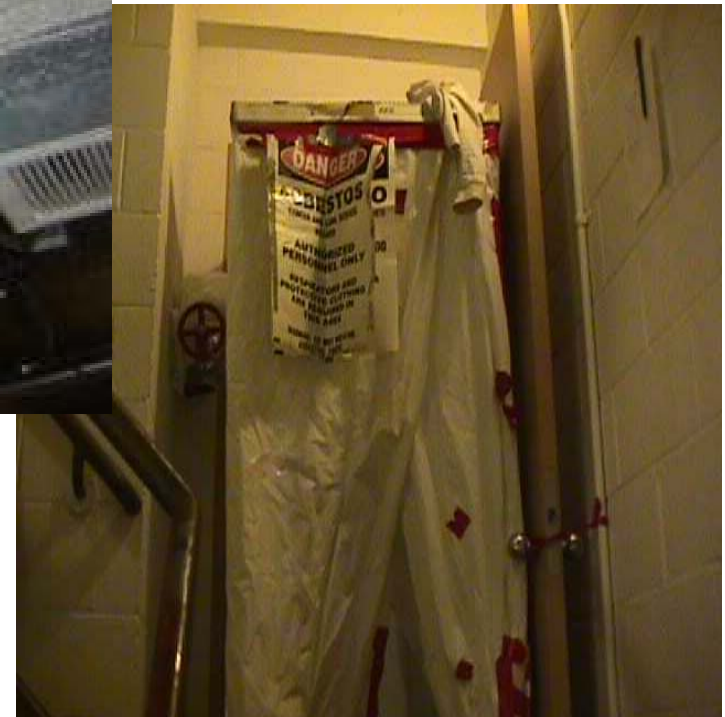


HVAC, Elect, Lighting Begins Anew

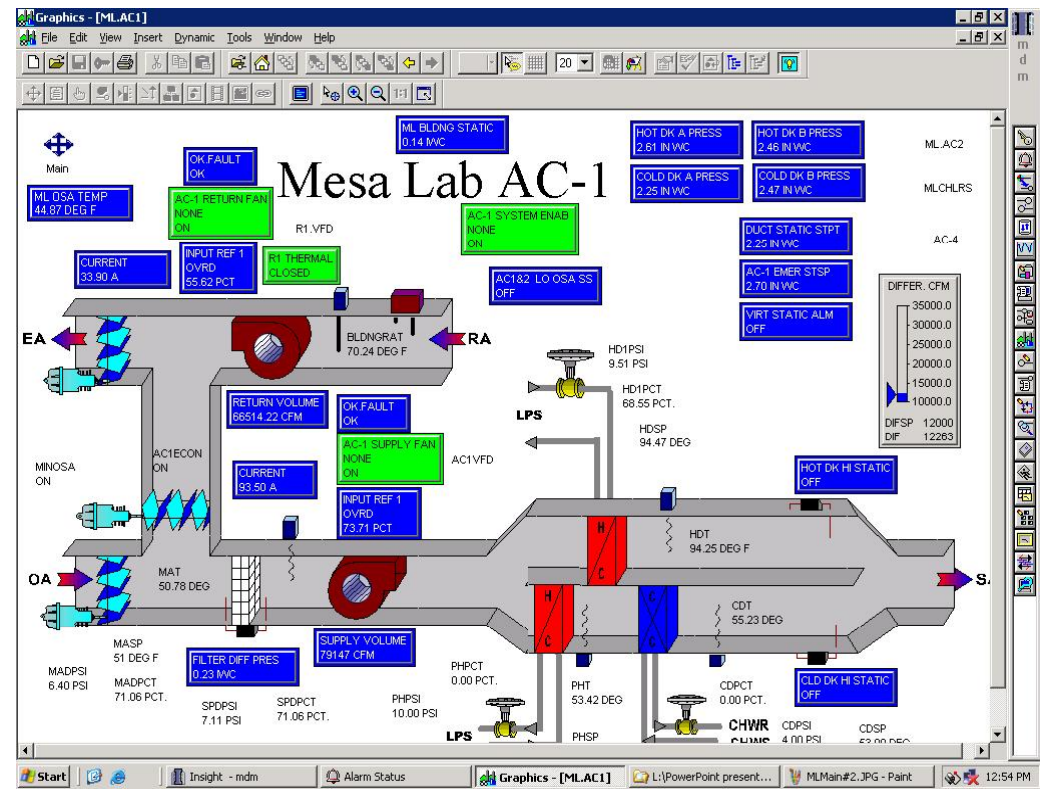
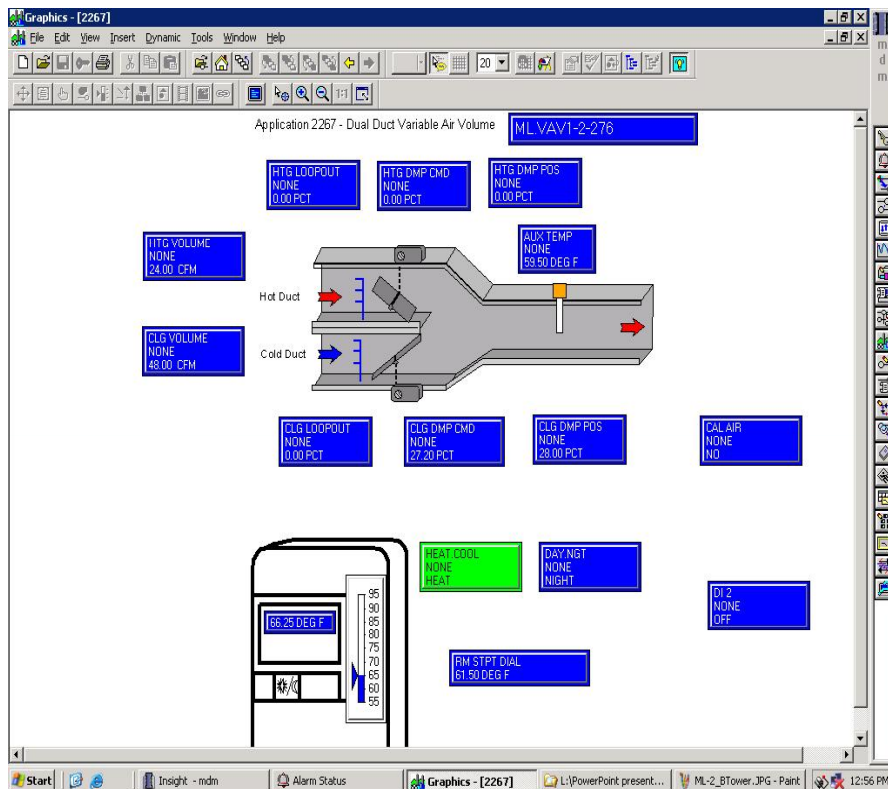
– “MLUR-2”

- ▶ Design Update begins 1 / 2006
- ▶ New Challenges
- ▶ Higher Costs
 - Inflation– old money
 - Asbestos Abatement
 - Existing Fire Suppression ...a liability

MLUR “2” Challenges



MLUR “2” Accomplishments



Installs 175 DDVAV's
Total 375 DDVAV's at ML

MLUR “2” Accomplishments



MLUR “2” Completed January 2007



MLUR



MLUR “Deferred”

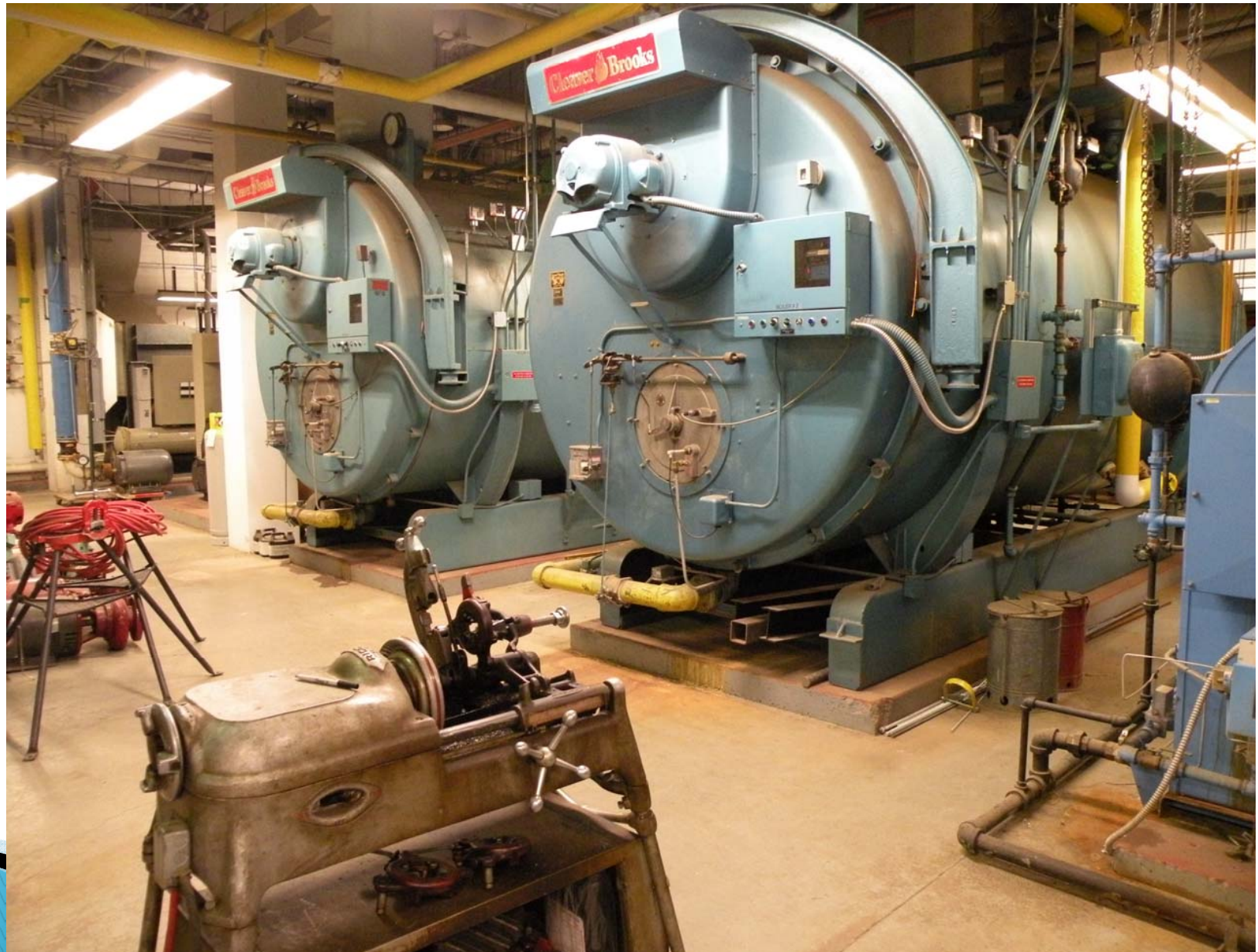
Infrastructure Refurbishment



Main Electrical Feeders

Replacement of the main underground electrical feeders with larger capacity directly buried cables will reduce the risk of a power failure.

MLUR “Deferred”



MLUR “Deferred”



MLUR “Deferred”



MLUR “Deferred”



Mesa Lab Summary



Planning for Future Projects

David Patterson

- ▶ Post MLUR Status
- ▶ Organizing Infrastructure Projects
- ▶ How do you ask for Money?
- ▶ Communicating Long-term Needs
- ▶ Results

Post MLUR Status

- ▶ MLUR Deferreds
 - \$7M
- ▶ No requests for capital dollars in the pipeline
- ▶ Recognized end-of-life on main feeders
- ▶ How do you communicate needs to Mgmt/NSF?

Organizing Projects

- ▶ Infrastructure Projects Progression
 - Getting a handle on projects
 - Estimating them
 - Prioritizing them
- ▶ Infrastructure Projects – Progression.xls

How do you ask for Money?

- ▶ UCAR/NCAR NSF Fact Sheet
- ▶ NSF Form 1030 Budget Proposal doesn't work well for infrastructure requests
- ▶ DOD Form 1391
- ▶ (PPS) UCAR NSF Funds Request

Communicating Needs

- ▶ Too much information is overwhelming!!
- ▶ Bundle requests in “bite size” requests
 - 2–3 years
- ▶ Always communicate long-term plan
- ▶ 2007 Infrastructure Fund Request

Results

- ▶ New Formalized Process for Planning & Communicating Funding Needs
- ▶ Additional \$1.5M Annual Budget Increase
- ▶ Prepared for “Stimulus Requests”
- ▶ Our Status Today

Research Aviation Facility (RAF)

Steven Haynes

- ▶ RAF Introduction
- ▶ Renovation Scope
- ▶ Expected Results



R.A.F.

- <http://www.hiaper.ucar.edu>
- <http://www.eol.ucar.edu/instrumentation/aircraft>



R.A.F. C-130



Hangars, Labs, & Office Space



Hangars, Labs, & Office Space



Where's the Sprinklers?



Upgrade HVAC



Other Deficiencies

- ▶ Upgrade Fire Detection System
- ▶ Replace/Upgrade Roof
- ▶ Replace/Upgrade Power Panels & Primary Gear
- ▶ Replace/ Upgrade Windows
- ▶ Replace Carpet
- ▶ Fresh Coat of Paint

Expected Results

- ▶ Energy Savings
- ▶ Improved Customer Service
- ▶ Less Maintenance
- ▶ Happier Place to Be

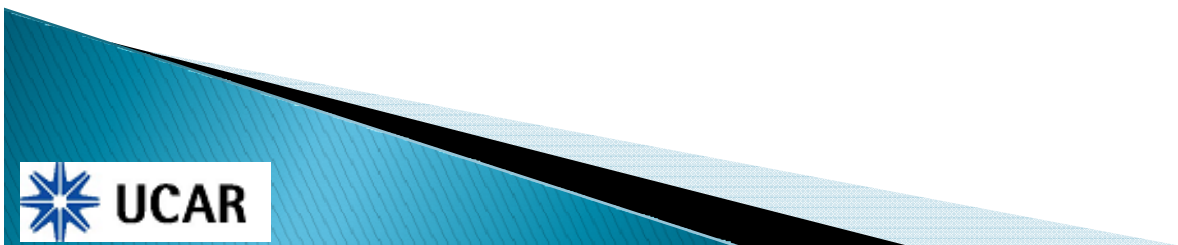
RAF Specification – “Green”

- ▶ “UCAR respects the environment through the responsible use of sustainable building products and systems. A/E shall suggest products and systems that are environmentally conscious to give UCAR choices to select Green Building items if practical.”

Sustainability

Kimberly Kosmenko

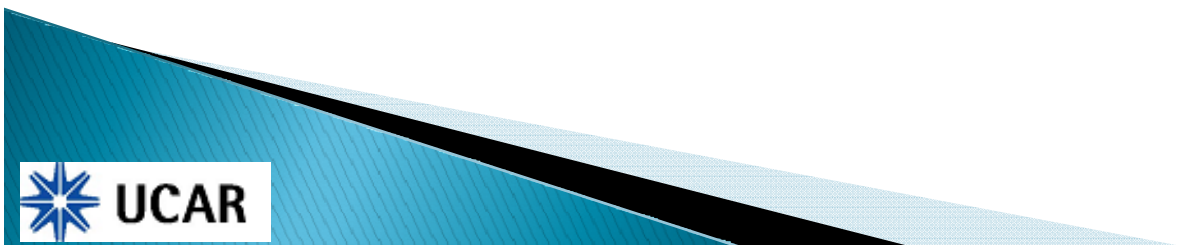
- ▶ What does UCAR mean by sustainability?
- ▶ Rating systems for sustainable operations
- ▶ Positive impacts of RAF renovation for sustainable operations
- ▶ Occupant impact on sustainable operations
- ▶ Employee health and sustainable operations



UCAR • NCAR • UOP⁶⁴

Sustainability

- ▶ **Net positive impact**
 - Organizational productivity
 - Environmental conservation
 - Community benefit



Metrics of Sustainability

- ▶ Energy use: quantity and type



Metrics of Sustainability

- ▶ Energy use: quantity and type
- ▶ Greenhouse gas emissions



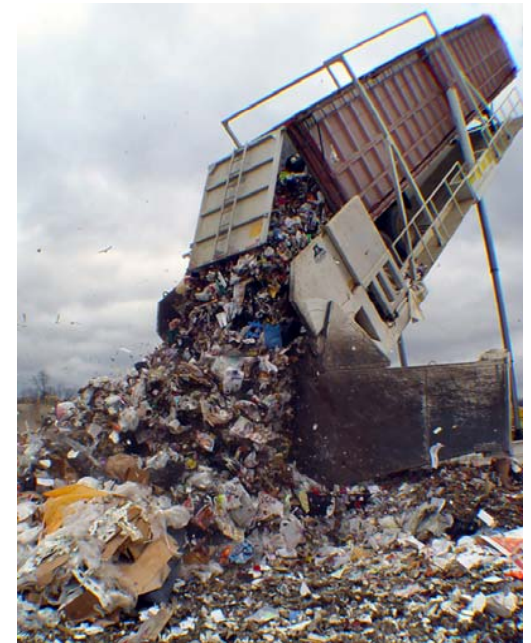
Metrics of Sustainability

- ▶ Energy use: quantity and type
- ▶ Greenhouse gas emissions
- ▶ Water consumption



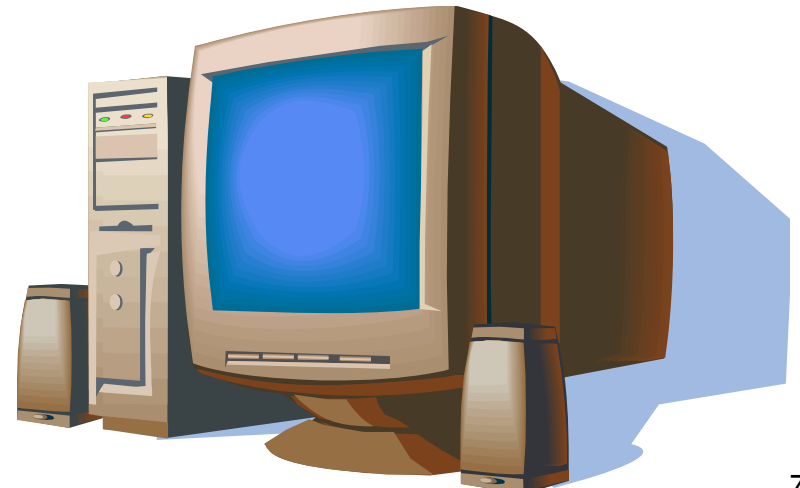
Metrics of Sustainability

- ▶ Energy use: quantity and type
- ▶ Greenhouse gas emissions
- ▶ Water consumption
- ▶ Waste management, recycling and reuse



Metrics of Sustainability

- ▶ Energy use: quantity and type
- ▶ Greenhouse gas emissions
- ▶ Water consumption
- ▶ Waste management, recycling and reuse
- ▶ Purchasing, materials selection



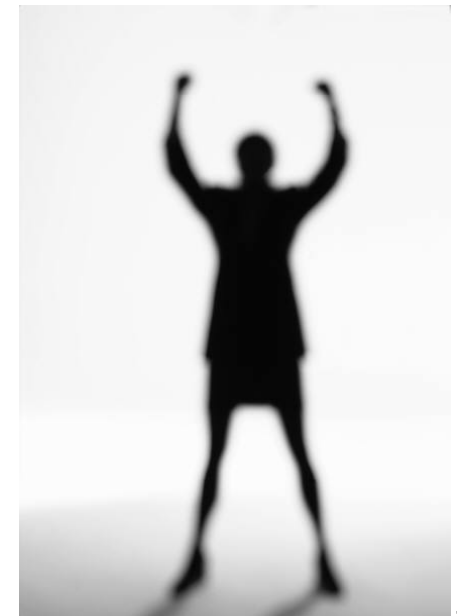
Metrics of Sustainability

- ▶ Energy use: quantity and type
- ▶ Greenhouse gas emissions
- ▶ Water consumption
- ▶ Waste management, recycling and reuse
- ▶ Purchasing, materials selection
- ▶ Indoor environmental quality



Metrics of Sustainability

- ▶ Energy use: quantity and type
- ▶ Greenhouse gas emissions
- ▶ Water consumption
- ▶ Waste management, recycling and reuse
- ▶ Purchasing, materials selection
- ▶ Indoor environmental quality
- ▶ Employee health and safety



Building Ratings

- ▶ LEED – Leadership in Energy and Environmental Design (U.S. Green Building Council)
- ▶ Energy Star (DOE/EPA)



Leadership in Energy & Environmental Design

What Is Green Building?





Leadership in Energy and Environmental Design

A leading-edge system
for certifying the
greenest performing
buildings in the world



Sustainability & Maintenance:

RAF Project

- ▶ Save energy – roofing, insulation, HVAC efficiency combined
- ▶ Potential for better indoor air quality, lower VOCs
- ▶ Reduce overall GHG emissions
- ▶ Improve employee comfort
- ▶ Reduce costs and disruptions from maintenance

Sustainability & Maintenance:

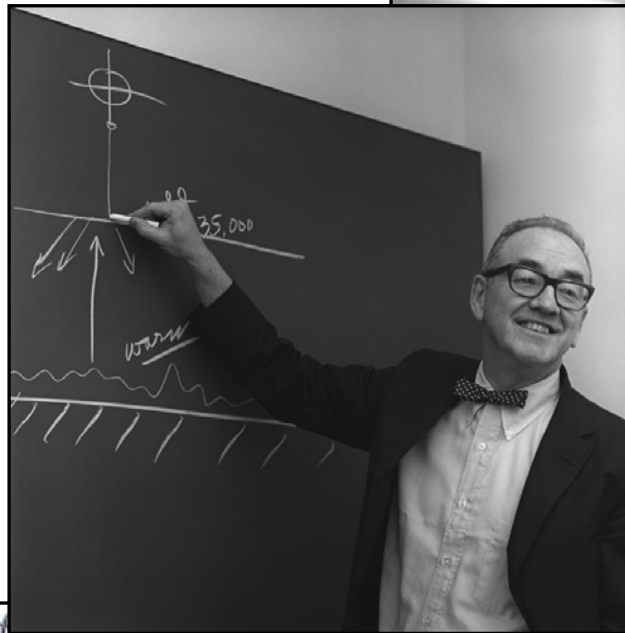
RAF Project

- ▶ Holistic approach to project: combine scope for materials, systems, insulation, etc.
- ▶ First costs *and* life cycle costs
- ▶ Consider inputs and outputs – materials, labor, repairs, resource use – over the long term

Mesa Lab



Technology Changes



Technology Changes



Technology Changes



Culture of Sustainability



- ▶ "UCAR is committed to reducing our environmental impacts, consistent with our mission to advance understanding of the atmospheric and related sciences and to benefit society as a whole... so that we all contribute to a healthier planet and a more sustainable society."
- ▶ *Rick Anthes, President, UCAR*

Occupant Impact





VOC Reduction

Brad Pattison

**And How We Apply It Planning for
future Remodel Projects...**

VOC

- ▶ **Volatile Organic Compounds – Compounds as defined by the United States Environmental Protection Agency (EPA)**
 - 40 CFR § 51.100 (s) (1)
 - want to purchase low VOC products

What is a “LOW” VOC Architectural Finish Product?

- ▶ UK coatings classification – Decorative Coatings

Name	Range
Minimal	$0\% \leq \text{VOC content} \leq 0.29\%$
Low	$0.3\% \leq \text{VOC content} \leq 7.99\%$
Medium	$8\% \leq \text{VOC content} \leq 24.99\%$
High	$25\% \leq \text{VOC content} \leq 50\%$
Very High	$50\% < \text{VOC content}$

Setting the Standards



▶ Environmental Protection Agency

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 59

National Volatile Organic Compound Emission Standards for
Architectural Coatings

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule

Setting the Standards

- ▶ Environmental Protection Agency
- ▶ South Coast Air Quality Management District (SCAQMD)



Setting the Standards

- ▶ Environmental Protection Agency
- ▶ South Coast Air Quality Management District (SCAQMD)
- ▶ CRI – **Green Label / Green Label Plus**
 - Carpet & Rug Institute



Setting the Standards

- ▶ Environmental Protection Agency
- ▶ South Coast Air Quality Management District (SCAQMD)
- ▶ CRI – Green Label / Green Label Plus
- ▶ **Green Seal**

The Mark of Environmental Responsibility

Green Seal is an independent non-profit organization dedicated to safeguarding the environment and transforming the marketplace by promoting the manufacture, purchase, and use of environmentally responsible products and services.



Setting the Standards

- ▶ Environmental Protection Agency
- ▶ South Coast Air Quality Management District (SCAQMD)
- ▶ CRI – Green Label / Green Label Plus
- ▶ Green Seal
- ▶ **HMIS – Hazardous Materials Identification System**

HMIS® III - Hazardous Materials Identification System



HMIS

► Hazardous Materials Identification System

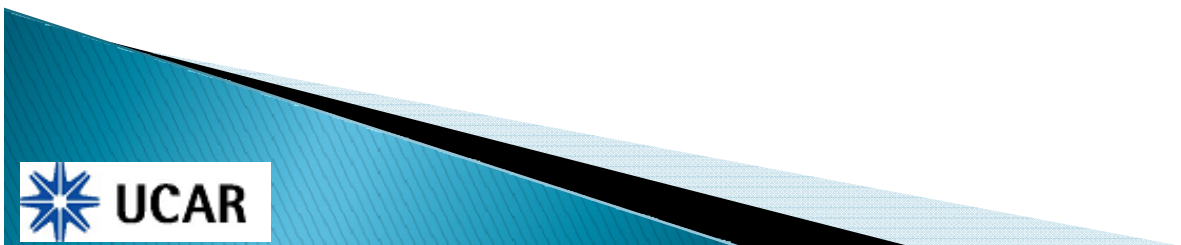
- * Chronic Hazard – Chronic (long-term) health effects may result from repeated overexposure.
- 0 – Minimal Hazard – No significant risk to health.
- 1 – Slight Hazard – Irritation or minor reversible injury possible.
- 2 – Moderate Hazard – Temporary or minor injury may occur.
- 3 – Serious Hazard – Major injury likely unless prompt action is taken and medical treatment is given.
- 4 – Severe Hazard – Life-threatening, major or permanent damage may result from single or repeated overexposures.

Terms

- ▶ IEQ – Indoor Environmental Quality (IEQ)
- ▶ IAQ – Indoor Air quality (IAQ)

Architectural Finish

Products used by UCAR



Acoustical Ceiling Tile



UL Classified												
Edge	Panel Size	Class	Item No.	NRC	CAC Min.	LR ³	Color ⁴	Grid Options	VOC Emissions	Abuse-Resistant	Recycled Content ⁵	Panel Cost
GLACIER Panels	SL 	2'x2'x3/4"	Class A	707	.65	35	.70	White	A	Zero	71%	\$\$
		Foil-Back						Standard Advantage				
		2'x2'x3/4"		715	.65	35	.70	White	A	Zero	70%	\$\$
		Foil-Back										
		2'x4'x3/4"	Class A	711	.65	35	.70	White	A	Zero	71%	\$\$
		Foil-Back										
	FL 	2'x2'x3/4"	Class A	708	.65	35	.70	White	B, C, D	Zero	71%	\$\$
		Foil-Back						Standard Advantage				
GLACIER Tile ^{6,7,8}	SESK 	12"x12"x3/4"	Class A	701	.65	25	.70	White	E	Zero	71%	\$\$\$\$

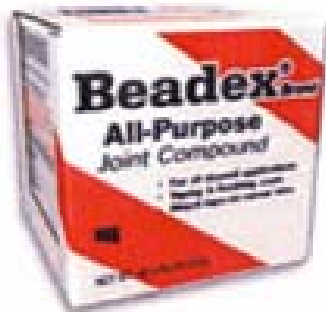
VOC Limits (grams / liter)

Architectural Application	EPA	SCAQMD	GS	UCAR
Ceiling Tile	N/A	N/A	N/A	0

Gypsum Wall Board



SHEETROCK® Gypsum Panels



PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Paper with gray to off white core	Vapor Density (Air = 1)	Not Applicable
Odor	Low to no odor	Specific Gravity (H ₂ O = 1)	2.32 – 2.96
Odor Threshold	Not Determined	Solubility in water (g/100g)	0.26/100g
Physical State	Solid	Partition Coefficient	Not Applicable
pH @ 25 ° C	~ 7	Auto-Ignition Temp	Not Determined
Melting Point	Not Applicable	Decomposition Temp	2650°F/1450°C
Freezing Point	Not Applicable	viscosity	Not Applicable
Boiling Point	Not Applicable	Particle Size	Varies
Flash Point	Not Determined	Bulk Density	~ 55 lb/ft ³
Evaporation Rate (BuAc = 1)	Not Applicable	Molecular Weight	~ 172
Upper Flammable Limit (UFL)	Not Determined	VOC Content	Zero
Lower Flammable Limit (LFL)	Not Determined	Percent Volatile	Zero
Vapor Pressure (mm Hg)	Not Applicable		

BEADEX® Multi-Purpose Joint Compound, Ready-Mixed



MATERIAL SAFETY DATA SHEET BEADEX® All Purpose Drywall Joint Compound

MSDS #61-360-023
Page 5 of 9

Freezing Point	32°F/ 0°C	Viscosity	Not Determined
Boiling Point	212°F/ 100°C	Particle Size	99% Finer than 250 microns
Flash Point	Not Determined	Bulk Density	1.5-1.7 kg/L
Evaporation Rate (BuAc = 1)	Not Determined	Molecular Weight	Mixture
Upper Flammable Limit (UFL)	Not Determined	VOC Content	<2 g/l
Lower Flammable Limit (LFL)	Not Determined	Percent Volatile	20-45
Vapor Pressure (mm Hg)	~24 mmHg@ 25°C		

VOC Limits (grams / liter)

Architectural Application	EPA	SCAQMD	GS	UCAR
Gypsum Board	NA	NA	NA	0
Drywall Joint Compound	SCAQMD	50	NA	<2g/L

Paints and Coatings

–Offices



PRODUCT NAME: AMBASSADOR INTERIOR FLAT WALL PAINT		HMIS CODES: H F R P		MATERIAL SAFETY DATA SHEET	
PRODUCT CODE: 1300 SERIES (WHITE, TINT BASES AND COLORS)				100B	
SECTION I - MANUFACTURER IDENTIFICATION					
MANUFACTURER'S NAME: KWAL-HOWELLS INC.					
ADDRESS: 3900 JOLIET STREET, DENVER, CO 80239					
EMERGENCY PHONE: 1-888-671-7846		INFORMATION PHONE: 303-371-5600			
DATE REVISED: 07-16-2008		NAME OF PREPARER: T. SNIDER			
REASON REVISED: REVISED					
SECTION II - HAZARDOUS INGREDIENTS/SARA III INFORMATION					
HAZARDOUS COMPONENTS	CAS NUMBER	OSHA PEL	ACGIH TLV	VAPOR PRESSURE OTHER mm HG	WEIGHT @ Temp Percent
*ETHYLENE GLYCOL	107-21-1	N/A	50ppm	N/A 0.1	68f 4.7
* Indicates toxic chemical(s) subject to the reporting requirements of section 313 of Title III and of 40 CFR 372					
SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS					
BOILING POINT: 212 deg F		SPECIFIC GRAVITY (H2O=1): 1.35			
VAPOR DENSITY: Lighter than air		EVAPORATION RATE: Slower than ether			
COATING V.O.C.: 1.68 LB/GL (202 G/L)					
SOLUBILITY IN WATER: Soluble					
APPEARANCE AND ODOR: Viscous liquid with slight ammonia or sweet odor.					

VOC Limits (grams / liter)

Architectural Application	EPA	SCAQMD	GS	UCAR
Flat Topcoat paint	250	250	50	202

Paints and Coatings

-Corridors



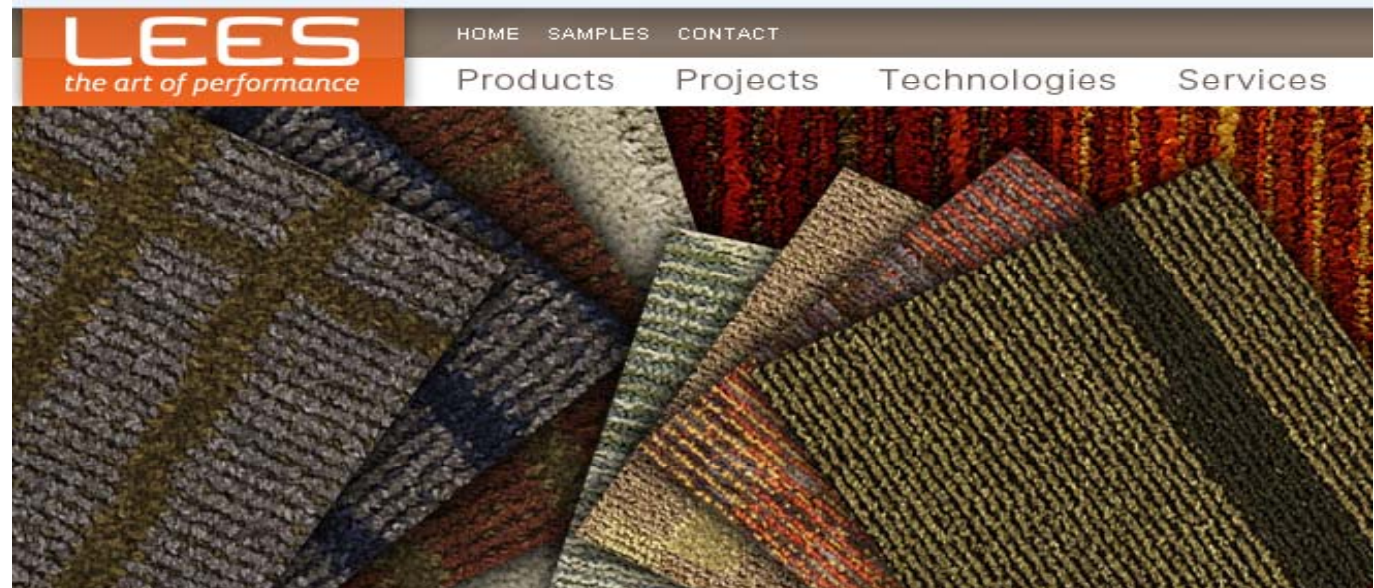
PRODUCT NAME: ACCUTONE INT.SATIN LATEX		HMIS CODES: H F R P		<u>MATERIAL SAFETY DATA SHEET</u>			
PRODUCT CODE: 2800 Series		1 0 0 B					
<u>SECTION I - MANUFACTURER IDENTIFICATION</u>							
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* Indicates toxic chemical(s) subject to the reporting requirements of section 313 of Title III and of 40 CFR 372							
<u>SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS</u>							
BOILING POINT: 212 Deg. F		SPECIFIC GRAVITY (H2O=1): 1.3					
VAPOR DENSITY: Heavier than air		EVAPORATION RATE:		Slower than ether			
COATING V.O.C.: 1.08 LB/GL (130 G/L)							

VOC Limits (grams / liter)

Architectural Application	EPA	SCAQMD	GS	UCAR
Non-Flat Topcoat paint	380	250	100	130

Carpet Systems – Carpet

Sustainable Manufacturing



Environmental Metrics

State-of-the-art technology has resulted in substantial improvements in environmental metrics, most notably 84% decrease in water consumption, 48% reduction in energy use, 53% reduction in solid waste, 39% reduction in emissions while increasing the usage of recycled materials by 128%.

Certifications

CRI Green Label Plus

All Lees products pass the CRI Green Label plus certification for VOC emissions.

VOC Limits (grams / liter)

Architectural Application	EPA	SCAQMD	GS	UCAR
Carpet / Carpet Pad	NA	NA	150	CRI Green Label Plus

Carpet Systems – Adhesive

Lees® Carpet Adhesives

Lees® Unibond® Wet Set RE Adhesive is especially formulated to install Lees Unibond backed and other broadloom carpets to approved substrates

- New easier spreading formulation
- Only adhesive warranted by Lees for use with Lees Unibond backed carpet
- Contains 20% *Recycled Content* by total weight
- Passes CRI Green Label and Passes SCAQMD Rule #1168
- Pail Comprised of 75% Post Industrial Material
- Contains MicroSept™ Antimicrobial protection



Four Gallon Pail

VOC LIMITS (grams / liter)

Architectural Application	EPA	SCAQMD	GS	UCAR
Carpet Adhesive	SCAQMD	50	150	CRI Green Label & SCAQMD #1168

Sealants

DAP® DYNAFLEX 230® Premium Elastomeric Sealant

DAP's most advanced latex sealant technology. It combines superior flexibility and durability of a silicone with the easy tooling, excellent paintability and low odor of latex. Provides excellent adhesion and a watertight, weatherproof seal. Cured caulk is mildew resistant. Easy water clean-up. Interior/exterior use. 50 Year Durability Guarantee. Meets Federal Specification TT-S-00230C, Type II, Class A and ASTM Specification C 920, Class 25.



HMIS Ratings:

Health: 1

Flammability: 1

Reactivity: 0

Personal Protection: X

VOC Limits (grams / liter)

Architectural Application	EPA	SCAQMD	GS	UCAR
Sealants	SCAQMD	70	150	Low VOC

Adhesives – Wall Base

GREEN SPECIFICATIONS



VPI Wall Base qualifies for LEED Materials and Resources Credits 4.1 and 4.2: Recycled Content.
VPI #600 Adhesive qualifies for LEED IEQ Credit 4.1: Low Emitting Adhesives and Sealants (Zero VOC's).



For more information visit us at www.vpiflooring.com
Contact us at 800-874-4240 or e-mail floor@vpicorp.com

VPI Corporation
3123 South 9th Street, Sheboygan, WI 53081
Mailing Address:
P.O. Box 451, Sheboygan, WI 53082-0451
Phone: 920-458-4664 Fax: 920-458-1368



MATERIAL SAFETY DATA SHEET

SECTION 1: IDENTIFICATION OF PRODUCT

TRADE NAME: Rubber Wall Base, Stringer & Risers
PRODUCT NUMBER: Wall Base= X=Product, X=Size, XX=Color, XXX=Gauge Stringer/Risers=XXXX, XX=Length, XX=Color (x = Size, xxx = Color Code, xx = Gauge)

WHMIS CLASS: NOT CONTROLLED
DESCRIPTION: Vinyl Compound (PVC)
PRODUCT USE: BASE BOARD COVERINGS
TRANSPORT: DOT: Not Regulated
HMIS CODE: HEALTH (0) FIRE (0) REACTIVITY (0) SPECIFIC (0)
0: Minimal 1: Light 2: Moderate 3: High 4: Dangerous

SUPPLIER: VPI Corporation
3123 South 9th Street
P.O. Box 451
Sheboygan, WI 53082-0451
Phone: (800) 874-4240
EMERGENCY PHONE NUMBER: CHEMTREC (800) 424-9300

VOC Limits (grams / liter)

Architectural Application	EPA	SCAQMD	GS	UCAR
Wall Base & Adhesive	SCAQMD	50	150	0

Vinyl Composition Tile (VCT)



COMMERCIAL Flooring | USA & Canada

LEED ELIGIBILITY

EQ Credit 4.3 - Low-emitting Materials

MR Credit 4.0 - Recycled Content (10% or 20%)

MR Credit 5.0 - Local/Regional Materials & Sourcing



Now available in over 75 colors, the flooring design possibilities with Standard EXCELRON Imperial Texture are virtually endless. With true through-pattern construction, combine Imperial Texture with Standard EXCELRON MultiColor for even more design options. A 1/8-inch gauge equal to Armstrong's NATURAL CREATIONS luxury vinyl tile allows for easy transitioning and maintenance from area to area. **Standard EXCELRON Imperial Texture is FloorScore certified for low VOC (volatile organic compound) emissions.**

VOC Limits (grams / liter)

Architectural Application	EPA	SCAQMD	GS	UCAR
VCT & Adhesive	SCAQMD	50	150	Low VOC



Vinyl Composition Tile – Adhesive

TEC™



VCT Adhesive: TEC #TA-713 Resilient Tile Adhesive

Nonflammable. Clear thin spread, pressure-sensitive, latex. Interior.
Zero calculated VOC's

TECHNICAL DATA

	Premium Resilient Tile Adhesive TA-713
Physical State	Paste
Open Time [@72°F (22°C)]	1-2 hours. May be extended up to 24 hours if desired.
Color	Tan
Odor	None
Wt. per U.S. Gallon	9.04 lbs. ± .1 lb
Wt. per Litre	1.08 kg ± .01 kg
VOC per Liter of material [@72°F (22°C)]	0 (calculated)
Storage	Store in cool, dry location.
Shelf Life	Maximum of 1 year from date of manufacture in unopened package.
Freeze/Thaw Stability	Freeze/thaw stable to 10°F (-12°C). If frozen, slowly bring material back to room temperature and stir before using.

VOC Limits (grams / liter)

Architectural Application	EPA	SCAQMD	GS	UCAR
Carpet Adhesive	SCAQMD	50	150	0

Door Finishes



Sanding Sealer:

Superior Coatings / Gemini #S-7002 vinyl sealer

PHYSICAL AND CHEMICAL PROPERTIES – Clear Vinyl Sealer

S7002

BOILING POINT: 133F

MELTING POINT: N/A

VAPOR PRESSURE: N/A

VAPOR DENSITY: Heavier Than Air

SOLUBILITY IN WATER: N/A

SPECIFIC GRAVITY: .905

MATERIAL VOC LB/GL: 4.0338 lb/gl

MATERIAL VOC GM/LTR: 483 g/l

% VOLATILE BY VOLUME: 84.616%

EVAPORATION RATE: Faster than Butyl Acetate.

WEIGHT PER GALLON: 7.536 lb/gl

PH: N/A

ODOR: N/A

APPEARANCE: Colored Liquid

VOC Limits (grams / liter)

Architectural Application	EPA	SCAQMD	GS	UCAR
Door Finishes – Sanding Sealer	550	350	***	483

***Green Seal Standards – Standards in Development GS-47 Stains & Clear Finishes



Door Finishes



Top Coat:

Superior Coatings / Gemini #93-4 Bar Top Lacquer, satin

PHYSICAL AND CHEMICAL PROPERTIES – 93-4 Bar Top Lacquer, Satin

BOILING POINT: 180-181F

MELTING POINT: N/A

VAPOR PRESSURE: N/A

VAPOR DENSITY: Heavier Than Air

SOLUBILITY IN WATER: N/A

SPECIFIC GRAVITY: .947

MATERIAL VOC LB/GL: 5.5864 lb/gl

MATERIAL VOC GM/LTR: 669 g/l

% VOLATILE BY VOLUME: 78.653%

EVAPORATION RATE: Faster than Butyl Acetate.

WEIGHT PER GALLON: 7.882 lb/gl

PH: N/A

ODOR: N/A

APPEARANCE: Colored Liquid

VOC Limits (grams / liter)

Architectural Application	EPA	SCAQMD	GS	UCAR
Door Finishes – Top Coat	730	680	***	669

***Green Seal Standards – Standards in Development GS-47 Stains & Clear Finishes

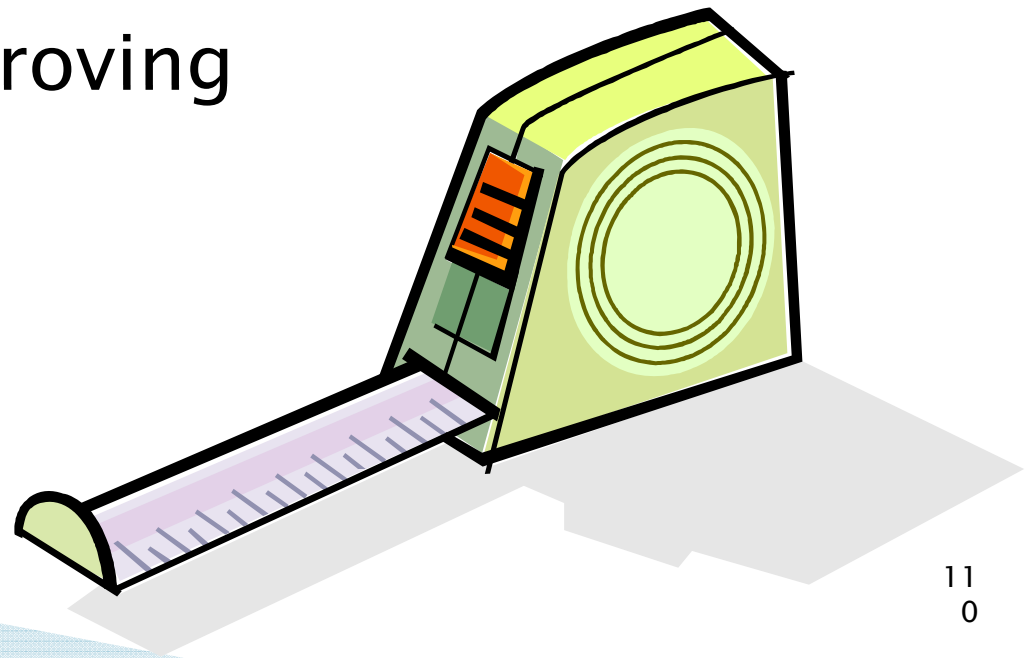


Conclusion_– UCAR Interior Architectural Finishes

- ▶ A total of 12 commonly used interior architectural products have been listed.
- ▶ All 12 < EPA Limits.
- ▶ 10 are < SCAQMD standards.
- ▶ 8 are < GS standards (2 unknown).

Measuring Success

- ▶ Metering wherever feasible
- ▶ Measure pre and post project
- ▶ For credibility
- ▶ For continued behavioral_c change
- ▶ For learning and improving



Conclusion / Discussion

John Pereira

- ▶ How We Did it Then
- ▶ How We Do it Now
- ▶ What's Next
- ▶ Discussion